

CLAIMS:

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. A grill assembly for cooking human food comprising:
 - (a) a housing, said housing comprising a support frame;
 - (b) a plurality of tubular cooking members rotatably mounted with said support frame;
 - (c) means for driving the tubular cooking members to rotate relative to the frame, comprising:
 - (i) an electric motor having a drive shaft;
 - (ii) a drive chain;
 - (iii) a drive sprocket drivingly connected with the motor shaft, the drive sprocket, having teeth and being positioned for engaging the drive chain so that rotation of the drive sprocket in engagement with the drive chain pulls the drive chain;
 - (iv) an idler sprocket rotatably mounted to the support frame, said idler sprocket having teeth for engaging the drive chain so movement of the drive chain in engagement with the idler sprocket teeth rotates the idler sprocket; and
 - (v) the tubular members having sprockets with teeth for engaging the drive chain so that movement of the drive chain in engagement with the sprocket teeth of the tubular members rotates the tubular members relative to the support frame.

2. The food grill of claim 1, further comprising the support frame having a structural reinforcement member, and the idler sprocket being rotatably mounted to the reinforcement member.

3. The food grill assembly of claim 2 wherein the structural reinforcement member has a first and a second rear extension, with an opening between the rear extensions, so that the drive chain can extend from engagement with a tubular member sprocket and pass through the opening to pass about the idler sprocket, and then extend through the opening to be engaged with the drive sprocket.

4. The food grill assembly of claim 1 further comprising a cover plate mounted to the support frame for covering the idler sprocket and covering the engagement means of the tubular members.

5. The food grill assembly of claim 1 wherein the drive chain is driven by the drive sprocket to move in a direction from the tubular members thence toward and about the idler sprocket and thence toward the drive sprocket.

6. A grill assembly for cooking human food comprising:

- (a) a housing, said housing comprising a support frame;
- (b) a plurality of tubular cooking members rotatably mounted with said support frame;
- (c) means for driving the tubular cooking members to rotate relative to the frame, comprising;
 - (i) a drive chain;

(ii) a drive sprocket rotatably mounted to the frame, the drive sprocket having teeth for engaging the drive chain so that rotation of the drive sprocket in engagement with the drive chain pulls the drive chain;

(iii) an idler sprocket rotatably mounted to the support frame, said idler member having teeth for engaging the drive chain so that movement of the drive chain in engagement with the idler sprocket rotates the idler sprocket;

(iv) the tubular members each having a sprocket with teeth for engaging the drive chain so that movement of the drive chain in engagement with the tubular members sprockets rotates the tubular members relative to the support frame, and

(d) means for powering the rotation of the drive sprocket, comprising an electric motor, so that the motor can rotate the drive sprocket with the drive sprocket pulling the chain to move in a direction from the tubular members thence toward and about the idler sprocket and thence toward the drive sprocket.

7. A grill assembly for cooking human food comprising:

(a) a housing, said housing comprising first and second support frames each of which has a wall, and each of which has a first end and a second end;

(b) a plurality of tubular cooking members each of which has first and second ends, and each of which has a central axis;

(c) the support frame walls each having a plurality of holes sized to receive an end of a tubular cooking member, the holes being arranged so that holes in the wall of the first frame are horizontally aligned with a corresponding hole in the second frame, with bearing members mounted with each said hole, the bearings shaped to receive and support an end of a tubular cooking member so that the tubular member and its central

axis extend horizontally from the first frame to the second frame, the wall holes being aligned so that the axes of the tubular members extend at an angle of about 3° to 5° from the first ends of the frames to the second ends of the frame.

8. The food grill of Claim 7, further comprising means for driving the tubular cooking members to rotate relative to the frame, comprising:

- (a) a drive chain;
- (b) a drive sprocket rotatably mounted to the frame, the drive sprocket having means for engaging the drive chain so that rotation of the drive sprocket in engagement with the drive chain pulls the drive chain;
- (c) an idler sprocket rotatably mounted to the support frame, said idler sprocket having means for engaging the drive chain so that movement of the drive chain in engagement with the idler sprocket rotates the idler sprocket;
- (d) the idler sprocket having a central axis which central axis is in alignment with the axes of the tubular members so that the axes of the tubular members along with the axis of the idler sprocket extend at an angle of about 3° to 5° from the first ends of the frames to the second ends of the frames.

9. A grill assembly for cooking human food comprising:

- (a) a housing with a side support frame, each frame having a vertically extending wall;
- (b) means for heating the food, said means being mounted with the housing frames;
- (c) means for controlling heating of the food;

(d) the housing having a control panel connected thereto; the control means being mounted in association with the control panel;

(e) a cover for covering the control panel and not for covering the means for heating the food, the cover having a wall; and

(f) means for pivotally mounting the cover to the housing so that the cover wall can be pivoted to a position to cover the control panel and to not cover the means for heating the food, and to a position to uncover the control panel, comprising: a pin, means for movably mounting the pin to one of the cover or a housing frame, the other of the cover or the housing frame having an opening for receiving the pin, and means for biasing the pin toward the opening, the pin being mounted to extend generally perpendicular to the walls of the housing frames, and to extend in a direction parallel with the cover wall.

10. The grill of Claim 9 wherein the means for mounting the pin comprises structure associated with the cover providing a first hole and a second hole, the pin being sized to slide within said holes, the biasing means being positioned between the first hole and the second hole.

11. The grill of Claim 10 wherein the pin has a first shaft section, the pin has a second enlarged shoulder section of larger diameter than the shaft section, and the pin has a third engagement section extending from the shoulder section in a direction away from the shaft, the biasing means comprising a spring having a first end and a second end, the spring first end abutting the pin shoulder and the spring second end abutting the cover structure about the second hole, so that the spring biases the pin shoulder in a direction toward the first hole in the cover structure.

12. The grill of Claim 11 wherein the opening for receiving the pin is an opening in the housing, and the third engagement section of the pin is biased in a direction toward the housing opening.

13. A grill assembly for cooking human foods comprising:

(a) a housing;

(b) means for heating the food, said means being mounted with the housing, the heating means comprising a plurality of tubular cooking members;

(c) means for controlling heating of the food;

(d) the housing having a control panel connected thereto, the control means being mounted in association with the control panel;

(e) a compartment assembly associated with the housing for storing of food items; means for mounting the compartment assembly to slide relative to the housing, the housing having a cavity with a first interior wall and a second interior wall, the compartment assembly having a frame comprising a first track member and a second track member, the distal ends of the first and second track members being mounted with a cover, the frame also comprising a cross strut connected to the first track and the second track so that an opening is formed between the tracks, the cross strut and the cover; a pan having walls with structure providing means for engaging the frame to be supported thereby, the pan being sized to fit between the first and second interior walls of the housing cavity and to be received within the housing cavity, the means for mounting the compartment assembly to slide relative to the housing allows the tracks to slide relative to the housing to a first position wherein the cover acts to cover the control panel, and a second position in which the cover is positioned away from the housing and the pan is positioned to expose it to permit items to be removed by hand therefrom; and

(f) the housing having a wall located beneath the tubular cooking members and above the cavity, and wherein the tubular cooking members are positioned in

proximity to the wall and to the cavity so that heat from the heating means warms food items contained within the pan when the tracks are in the said first position.

14. The structure of Claim 13 wherein the means for mounting the tracks to slide comprises the first interior wall having roller wheels rotatably mounted thereto, and the second interior wall having roller wheels rotatably mounted thereto, and wherein the tracks comprise channel-shaped members sized so that the first set of roller wheels can be received within the first channel to roll there along, and the second track is shaped to received the second set of roller wheels so that the second set of wheels can roll there along.

15. The grill assembly of Claim 6, further comprising:

- (a) the housing comprising a first support frame and a second support frame;
- (b) a plurality of tubular cooking members having first and second ends rotatably mounted with the first support frame and the second support frame, respectively, the tubular cooking members having housed within them an elongated heating member; each heating member comprising an outer heat conducting sheath having first and second ends and an electrical heating element extending there through, said heating element having first and second ends, the heating element having a wound spiral configuration, with the spacing between each of the spiral winds of the heating element being more compact at the areas near the first and second ends of the heating element than in the central part of the heating element, with each of the first and second ends of the heating element being connected with first and second electrical contacts, respectively; and heat dispersing material within the sheath surrounding the heating element;

(c) first cover structure mounted with the first frame to substantially cover the first ends of the roller tubes mounted to the first frame, and second cover plate structure mounted with the second frame to substantially cover the second ends of the roller tubes mounted with the second frame, the first cover structure having openings there through sized to receive corresponding first ends of the sheathes to support the sheathes, and the second cover structure having openings sized to receive the second ends of the sheathes to support the sheathes.

16. The grill assembly of Claim 15 wherein mount strips are mounted to one of the cover structures, said mount strips having openings sized to receive a sheath end, and wherein an end of the sheathes extends through a corresponding mount strip opening to be supported thereby.

17. The grill of Claim 15 wherein the tubular cooking members have surfaces covered with a layer of a polymer of tetrafluoroethylene.

18. A grill assembly for cooking human food comprising:

- (a) a housing;
- (b) means for heating the food, said means being mounted with the housing;
- (c) means for controlling heating of the food;
- (d) the housing having a control panel connected thereto; the control means being mounted in association with the control panel;
- (e) a cover for covering the control panel and not for covering the means for heating the food; means for pivotally mounting the cover to the housing so that the cover can be pivoted to a position to cover the control panel and to not cover the means for heating the food, and to a position to uncover the control panel, comprising: a spring having a first leg

that extends into a bight section, the bight section extending into a second leg, a boss extending from the first leg, the cover having first structure with an opening for receiving the boss, the cover also having second structure against which the second leg can be placed so that with such placement the first leg is biased toward the opening in the first structure to press the boss through the opening in the first structure, the housing having an opening for receiving the boss to allow the cover to pivot relative to the housing.

19. The grill assembly of Claim 18 wherein the boss is integral with the first leg of the spring.

20. The grill assembly of Claim 19 wherein the second structure comprises the cover having a rear side with a pin projecting rearwardly therefrom, with the second spring leg having an outer surface which can be placed against the pin, and wherein the second structure comprises the cover having a tab projecting rearwardly therefrom, said tab having an opening that receives the boss, the tab having an inside surface with the outside surface of the first leg being placed to press there against, so that the spring biasing action presses the first leg outer surface against the tab inner surface, and presses the second leg so that its outer surface presses against the pin.

21. The food grill assembly of Claim 20 wherein the spring member is comprised of spring steel.

22. A grill assembly for cooking human food comprising:

(a) a housing, said housing comprising side support frames, each frame having a vertically extending wall;

(b) a plurality of tubular cooking members rotatably mounted with the walls of said support frames;

(c) means for driving the tubular cooking members to rotate relative to the frame, comprising;

(i) an electric motor having a drive shaft;

(ii) a drive chain;

(iii) a drive sprocket drivingly connected with the motor shaft, the drive sprocket, having teeth and being positioned for engaging the drive chain so that rotation of the drive sprocket in engagement with the drive chain pulls the drive chain;

(iv) an idler sprocket rotatably mounted to the support frame, said idler sprocket having teeth for engaging the drive chain so movement of the drive chain in engagement with the idler sprocket teeth rotates the idler sprocket; and

(v) the tubular members having sprockets with teeth for engaging the drive chain so that movement of the drive chain in engagement with the sprocket teeth of the tubular members rotates the tubular members relative to the support frame.

(d) means for heating the food, said means being mounted with the housing;

(e) means for controlling heating of the food;

(f) the housing having a control panel connected thereto; the control means being mounted in association with the control panel;

(g) a cover for covering the control panel and not for covering the means for heating the food, the cover having a wall; and

(h) means for pivotally mounting the cover to the housing so that the cover wall can be pivoted to a position to cover the control panel and to not cover the means for heating the food, and to a position to uncover the control panel, comprising: a pin, means for movably

mounting the pin to one of the cover or a housing frame, the other of the cover or the housing frame having an opening for receiving the pin, and means for biasing the pin toward the opening, the pin being mounted to extend generally perpendicular to the wall of the housing frame with which the pin is mounted or received, and to extend in a direction parallel with the cover wall.

23. A grill assembly for cooking human food comprising:

- (a) a housing, said housing comprising a support frame;
- (b) a plurality of tubular cooking members rotatably mounted with said support frame;
- (c) means for driving the tubular cooking members to rotate relative to the frame, comprising:
 - (i) an electric motor having a drive shaft;
 - (ii) a drive chain;
 - (iii) a drive sprocket drivingly connected with the motor shaft, the drive sprocket, having teeth and being positioned for engaging the drive chain so that rotation of the drive sprocket in engagement with the drive chain pulls the drive chain;
 - (iv) an idler sprocket rotatably mounted to the support frame, said idler sprocket having teeth for engaging the drive chain so movement of the drive chain in engagement with the idler sprocket teeth rotates the idler sprocket; and
 - (v) the tubular members having sprockets with teeth for engaging the drive chain so that movement of the drive chain in engagement with the sprocket

teeth of the tubular members rotates the tubular members relative to the support frame.

(d) means for heating the food, said means being mounted with the housing;

(e) means for controlling heating of the food;

(f) the housing having a control panel connected thereto; the control means being mounted in association with the control panel;

(g) a cover for covering the control panel and not for covering the means for heating the food;

(h) means for pivotally mounting the cover to the housing so that the cover can be pivoted to a position to cover the control panel and to not cover the means for heating the food, and to a position to uncover the control panel, comprising: a spring having a first leg that extends into a bight section, the bight section extending into a second leg, a boss extending from the first leg, the cover having first structure with an opening for receiving the boss, the cover also having second structure against which the second leg can be placed so that with such placement the first leg is biased toward the opening in the first structure to press the boss through the opening in the first structure, the housing having an opening for receiving the boss to allow the cover to pivot relative to the housing.

24. A grill assembly for cooking human food comprising:

(a) a housing, said housing comprising a support frame;

(b) means for heating the food, comprising a plurality of tubular cooking members rotatably mounted with said support frame;

(c) means for driving the tubular cooking members to rotate relative to the frame, comprising;

thereby, the pan being sized to fit between the first and second interior walls of the housing cavity and to be received within the housing cavity, the means for mounting the compartment assembly to slide relative to the housing allows the tracks to slide relative to the housing to a first position wherein the cover acts to cover the control panel, and a second position in which the cover is positioned away from the housing and the pan is positioned to expose it to permit items to be removed by hand therefrom.

25. The grill assembly of Claim 24 further comprising:

(a) the housing comprising first and second support frames each of which has a wall, and each of which has a first end and a second end;

(b) a plurality of tubular cooking members each of which has first and second ends, and each of which has a central axis;

(c) the support frame walls each having a plurality of holes sized to receive an end of a tubular cooking member, the holes being arranged so that holes in the wall of the first frame are horizontally aligned with a corresponding hole in the second frame, with bearing members mounted with each said hole, the bearings shaped to receive and support an end of a tubular cooking member so that the tubular member and its central axis extend horizontally from the first frame to the second frame, the wall holes being aligned so that the axes of the tubular members extend at an angle of about 3° to 5° from the first ends of the frames to the second ends of the frame.

26. The grill assembly of Claim 25 further comprising:

(a) the tubular cooking members having first and second ends rotatably mounted with the first support frame and the second support frame, respectively, the tubular cooking members having housed within them an elongated heating member; each

heating member comprising an outer heat conducting sheath having first and second ends and an electrical heating element extending there through, said heating element having first and second ends, the heating element having a wound spiral configuration, with the spacing between each of the spiral winds of the heating element being more compact at the areas near the first and second ends of the heating element than in the central part of the heating element, with each of the first and second ends of the heating element being connected with first and second electrical contacts, respectively; and heat dispersing material within the sheath surrounding the heating element;

(b) first cover structure mounted with the first frame to substantially cover the first ends of the roller tubes mounted to the first frame, and second cover plate structure mounted with the second frame to substantially cover the second ends of the roller tubes mounted with the second frame, the first cover structure having openings there through sized to receive corresponding first ends of the sheathes to support the sheathes, and the second cover structure having openings sized to receive the second ends of the sheathes to support the sheathes.

27. The grill assembly of Claim 24 further comprising a guard for covering food located with a housing, the guard comprising:

(a) first and second legs, the legs having side walls, the leg side walls extending upwardly into a top section, each side wall having a bottom, each side wall having a first end, and the side walls having an opening at the first end of the side walls that extends between and from the bottoms of the side walls to the top section so that the side walls are separated from one another by said opening, the opening extending into a passageway located between the sidewalls;

(b) a flap, means for mounting the flap with the guard to be movable relative to the side walls so that the flap can be moved to a first position wherein the flap covers the opening, and moved to a second position away from the first ends of the side walls to expose the opening to allow a hand to be extended through the opening into the passageway to grasp food located on the housing.

28. A grill assembly for cooking human foods comprising:

(a) a housing;

(b) means for heating the food, said means being mounted with the housing, the heating means comprising a plurality of tubular cooking members, said cooking members having cylindrical outer surfaces;

(c) means for controlling heating of the food;

(d) the housing having a control panel connected thereto, the control means being mounted in association with the control panel;

(e) a sealing assembly comprising a bearing member, and an annular sealing member, the bearing member having a bore there through for receiving the tubular member there through, the bearing member bore having a section which has an annular recessed shape for receiving the annular sealing member, so that the bearing member and annular member can be placed about the tubular member with the annular sealing member held against the outer surface of the tubular member; and

(f) a compartment assembly associated with the housing for storing of food items; means for mounting the compartment assembly to slide relative to the housing, the housing having a cavity with a first interior wall and a second interior wall, the compartment assembly having a frame comprising a first track member and a second

track member, the distal ends of the first and second track members being mounted with a cover, the frame also comprising a cross strut connected to the first track and the second track so that an opening is formed between the tracks, the cross strut and the cover; a pan having walls with structure providing means for engaging the frame to be supported thereby, the pan being sized to fit between the first and second interior walls of the housing cavity and to be received within the housing cavity, the means for mounting the compartment assembly to slide relative to the housing allows the tracks to slide relative to the housing to a first position wherein the cover acts to cover the control panel, and a second position in which the cover is positioned away from the housing and the pan is positioned to expose it to permit items to be removed by hand therefrom.

29. The grill assembly of Claim 28 further comprising:

(a) the housing comprising first and second support frames each of which has a wall, and each of which has a first end and a second end;

(b) a plurality of tubular cooking members each of which has first and second ends, and each of which has a central axis;

(c) the support frame walls each having a plurality of holes sized to receive an end of a tubular cooking member, the holes being arranged so that holes in the wall of the first frame are horizontally aligned with a corresponding hole in the second frame, with bearing members mounted with each said hole, the bearings shaped to receive and support an end of a tubular cooking member so that the tubular member and its central axis extend horizontally from the first frame to the second frame, the wall holes being aligned so that the axes of the tubular members extend at an angle of about 3° to 5° from the first ends of the frames to the second ends of the frame.

30. The grill assembly of Claim 29 further comprising:

(a) the tubular cooking members having first and second ends rotatably mounted with the first support frame and the second support frame, respectively, the tubular cooking members having housed within them an elongated heating member; each heating member comprising an outer heat conducting sheath having first and second ends and an electrical heating element extending there through, said heating element having first and second ends, the heating element having a wound spiral configuration, with the spacing between each of the spiral winds of the heating element being more compact at the areas near the first and second ends of the heating element than in the central part of the heating element, with each of the first and second ends of the heating element being connected with first and second electrical contacts, respectively; and heat dispersing material within the sheath surrounding the heating element;

(b) first cover structure mounted with the first frame to substantially cover the first ends of the roller tubes mounted to the first frame, and second cover plate structure mounted with the second frame to substantially cover the second ends of the roller tubes mounted with the second frame, the first cover structure having openings there through sized to receive corresponding first ends of the sheathes to support the sheathes, and the second cover structure having openings sized to receive the second ends of the sheathes to support the sheathes.

31. The grill assembly of Claim 28, further comprising a guard for covering food located with a housing, the guard comprising:

(a) first and second legs, the legs having side walls, the leg side walls extending upwardly into a top section, each side wall having a bottom, each side wall having a first end, and the side walls having an opening at the first end of the side walls

that extends between and from the bottoms of the side walls to the top section so that the side walls are separated from one another by said opening, the opening extending into a passageway located between the sidewalls; and

(b) a flap, means for mounting the flap with the guard to be movable relative to the side walls so that the flap can be moved to a first position wherein the flap covers the opening, and moved to a second position away from the first ends of the side walls to expose the opening to allow a hand to be extended through the opening into the passageway to grasp food located on the housing.

32. A grill assembly for cooking human food comprising:

(a) a housing;

(b) means for heating the food, said means being mounted with the housing, said means comprising a plurality of tubular cooking member rotatably mounted to the housing, said cooking members having cylindrical outer surfaces;

(c) means for controlling heating of the food;

(d) a sealing assembly comprising a bearing member, and an annular sealing member, the bearing member having a bore there through for receiving the tubular member there through, the bearing member bore having a section which has an annular recessed shape for receiving the annular sealing member, so that the bearing member and annular member can be placed about the tubular member with the annular sealing member held against the outer surface of the tubular member;

(e) the housing having a control panel connected thereto; the control means being mounted in association with the control panel;

(f) a cover for covering the control panel and not for covering the means for heating the food; and

(g) means for pivotally mounting the cover to the housing so that the cover can be pivoted to a position to cover the control panel and to not cover the means for heating the food, and to a position to uncover the control panel.

33. The grill assembly of Claim 32 wherein the pivot means comprises a pin, means for movably mounting the pin to one of the cover or the housing, the other of the cover or the housing having an opening for receiving the pin, and means for biasing the pin toward the opening.

34. The sealing assembly of Claim 32 wherein the pivot means comprises a spring having a first leg that extends into a bight section, the bight section extending into a second leg, a boss extending from the first leg, the cover having first structure with an opening for receiving the boss, the cover also having second structure against which the second leg can be placed so that with such placement the first leg is biased toward the opening in the first structure to press the boss through the opening in the first structure, the housing having an opening for receiving the boss to allow the cover to pivot relative to the housing.

35. The grill assembly of Claim 32, further comprising:

(a) the housing comprising first and second support frames each of which has a wall, and each of which has a first end and a second end;

(b) a plurality of tubular cooking members each of which has first and second ends, and each of which has a central axis;

(c) the support frame walls each having a plurality of holes sized to receive an end of a tubular cooking member, the holes being arranged so that holes in the wall of the

first frame are horizontally aligned with a corresponding hole in the second frame, with bearing members mounted with each said hole, the bearings shaped to receive and support an end of a tubular cooking member so that the tubular member and its central axis extend horizontally from the first frame to the second frame, the wall holes being aligned so that the axes of the tubular members extend at an angle of about 3° to 5° from the first ends of the frames to the second ends of the frame.

36. The grill assembly of Claim 35 further comprising:

(a) the tubular cooking members having first and second ends rotatably mounted with the first support frame and the second support frame, respectively, the tubular cooking members having housed within them an elongated heating member; each heating member comprising an outer heat conducting sheath having first and second ends and an electrical heating element extending there through, said heating element having first and second ends, the heating element having a wound spiral configuration, with the spacing between each of the spiral winds of the heating element being more compact at the areas near the first and second ends of the heating element than in the central part of the heating element, with each of the first and second ends of the heating element being connected with first and second electrical contacts, respectively; and heat dispersing material within the sheath surrounding the heating element;

(b) first cover structure mounted with the first frame to substantially cover the first ends of the roller tubes mounted to the first frame, and second cover plate structure mounted with the second frame to substantially cover the second ends of the roller tubes mounted with the second frame, the first cover structure having openings there through sized to receive corresponding first ends of the sheathes to support the sheathes, and the

second cover structure having openings sized to receive the second ends of the sheathes to support the sheathes.

37. The grill assembly of Claim 32, further comprising a guard for covering food located with a housing, the guard comprising:

(a) first and second legs, the legs having side walls, the leg side walls extending upwardly into a top section, each side wall having a bottom, each side wall having a first end, and the side walls having an opening at the first end of the side walls that extends between and from the bottoms of the side walls to the top section so that the side walls are separated from one another by said opening, the opening extending into a passageway located between the sidewalls; and

(b) a flap, means for mounting the flap with the guard to be movable relative to the side walls so that the flap can be moved to a first position wherein the flap covers the opening, and moved to a second position away from the first ends of the side walls to expose the opening to allow a hand to be extended through the opening into the passageway to grasp food located on the housing.